DECLARATION UNDER 37 CFR § 1.132

DECLARATION OF SORIN MARCOVICI
PROVINCE OF QUEBEC, CANADA

I, Sorin Marcovici, hereby declare and state that:

1. I am the President of Anrad Corporation, located in Montreal, Quebec, Canada, a wholly owned subsidiary of Analogic Corporation of Peabody, Massachusetts.

2. I have been employed by Analogic Corporation in various capacities since 1976 and since1987 I am a Vice President. Analogic is a leading developer and manufacturer of advanced subsystems for medical imaging and Digital Radiology (DR) systems. Further information on Analogic may be found at www.analogic.com.

3. I have received a Physicist Engineer degree in Electronics from the Polytechnic Institute of Bucharest in 1970 and a Master's degree in Electrical Engineering from Northeastern University, Boston, in 1981.

4. I am well versed in the technology of X-ray detectors and related fields.

5. The list of scientific papers that I authored or co-authored is attached hereto as Appendix 1.

6. The list of patents in which I am inventor or co-inventor is attached hereto as Appendix 2.

7. I have read and understood the subject matter of the United States Patent Application No. 09/334,671 filed on June 17, 1999 by Rougeot et al., entitled "Indirect X-Ray Image detector for Radiology".

8. I have reviewed the prosecution file of the above Rougeot et al. application, culminating in the telephone interview between the Examiner, Shun Lee, and the Patent Agent handling this case, George Primak, and followed up by the Examiner's response to this interview.

9. I have carefully considered the Examiner's response to this interview and his continued rejection of the Rougeot et al. application, based on the following premise, as expressed by the Examiner:

"First it should be noted that Applicant discloses (Figs. 2 and 3) a photoreceptor 16 with a common electrode 14 connected to a source of HT voltage (i.e. biased) and pixelated conduction pads 24. It should also be noted that Morton discloses

(Figs. 6 and 7) a photoreceptor 201 with a common electrode 202 connected to a source of HT voltage (column 7, lines 24-29) and pixelated collection electrodes 101 (column 7, lines 1-6).

"Applicant then appears to argue that photoreceptor 201 are of necessity pixelated (illustrated in applicant's lower Figure on pg. 2 as "pixelated structure") since the separation of charges comes from pixelation whereas photoreceptor 16 is not pixelated (illustrated in applicant's lower Figure on pg. 3 as "No pixelation") since it is the electric field that provides the position of the charges. Examiner respectfully disagrees. Morton states (column 7, lines 54-65) that "There is also provided on surface S1 a thin, narrow layer 203 of heavily-doped n^+- type material (a-Si:H:n^+) which substantially surrounds each charge-collection 101 and its associated field effect transistor 31. Also, a layer 204 of heavily-doped p^+-type material (a-Si:H:p^+) is deposited on each electrode 101. The spatial distribution of layers 203,204 is such as to create potential minima Pm within the second capacitor 20, as shown in the idealised form in FIG. 7, so that charge (in this embodiment electrons) produced within layer 201 is constrained to move within a potential well and is thereby focused onto the respective charge collection electrode". Thus common electrode 202 (connected to a source of HT voltage) and pixelated collection electrodes 101 (with associated structures 203,204) create an electric field having a potential minima Pm that constrain and drive charge movement ant it is also clear from the description and Figs. 6 and 7 that photoreceptor 201 is not pixelated. Thus applicant's arguments are not persuasive."

Thus, the basis of the Examiner's rejection of Rougeot et al. application is premised on the Examiner's opinion that photoreceptor 201 of Morton's patent No. 5,693,947 is **not pixelated** and that therefore the Morton and Rougeot et al. structures are similar in nature.

10. I have carefully read and understood U.S. Patent No. 5,693,947 of Morton, to which the Examiner refers, and I cannot agree with the Examiner's conclusion that Morton's photoreceptor 201 is not pixelated.

By comparing Morton's Fig. 7 with Figs. 2 and 3 of Rougeot et al., I observe a clear difference in the way the charges are driven to collection electrodes. In the structure of Rougeot et al, the charges follow the high intensity electrical field lines and move parallel through the entire amorphous selenium thickness, arriving at continuous planar electrodes. Thus, the selenium based multilayer structure of Rougeot et al. is not pixelated.

On the other hand, as shown in Morton's Fig. 7, within the ionization medium 201, by extra depositions of doped materials around the pixel capacitor, there is a supplemental electrical field, Pm, totally different from the field across

capacitor C2, that creates "means of electronic focusing" (column 8, line13) on the charges, guiding them along curved trajectories to specific pixel locations (see also Morton's Claim 23). Such ionization medium topology, using local fields to create charge collecting pixels surrounded by areas which do not collect charges, is clearly "pixelated" and, consequently, Morton's photoreceptor 201 is pixelated.

Morton's structure basically consists of two capacitors in series, with C_1 of the pixel 100 to 10,000 times larger (column 4, line 5) than C_2 of the uni-layer ionization medium. Given the basic electrostatic equations, the larger the capacitance the thinner the dielectric material of the capacitor must be for the same area of the electrodes. Since the pixel capacitors have electrodes much smaller than the continuous ionization medium C_2 plate, it implies that, for not very different dielectric constants of materials, the thickness of C_2 dielectric (ionization medium) is much larger than the thickness of C_1 dielectric (pixel capacitor) and possibly the width of the pixel. This qualitative estimation is coherent with the intended use of the dual capacitors structure implemented to protect the pixel capacitor and read-out circuitry (see column 1, starting at line 46, of Morton). The operation of Morton structure is, therefore, based on a simple transfer of charges from C_2 to C_1.

In contrast, the amorphous selenium of Rougeot et al. has a multi-layer structure, typically with three differently doped layers, n-i-p or p-i-n depending on the embodiment, in which the top and bottom layers operate as blocking contacts. This multi-layer structure operation, as described starting on page 6, line 21, of the disclosure, is more complex and different from that of a simple capacitor. Furthermore, on page 7, line 2, it is clearly stated that "the thickness of the selenium multilayer is much less than the width of a pixel electrode".

The distinction between charge transfer mechanisms is emphasized by Morton's statement: "since positive ions typically have lower mobility than electrons in ionization media, spatial resolution will usually be maximized when positive ions caused to drift to electrode 13" (column 6, lines 54-57). In the structure of Rougeot et al., amorphous selenium does not produce ions, but rather electrons and holes (positive charge carriers) and the electrons mobility is typically 20 times smaller than holes mobility. In other words, in the structure of Rougeot et al. positive charges move much faster than negative charges, whereas in Morton structure there is the opposite condition.

For the above reasons, I do not agree with the Examiner's statement that the structure of Morton is essentially similar to that of Rougeot et al. and that Morton's photoreceptor is not pixelated.

11. I, the undersigned, further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing there from.

January 27th, 2004
Date:

Signature: Sorin Marcovici